DOCUMENT RESUME

ED 309 388 CS 009 732

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TITLE A Study of the Effectiveness of Instruction in Multi-Age Grading vs. Traditional Single-Grade Level Organization on the Reading Achievement of Fourth Graders.
PUB DATE Apr 89
NOTE 51p.; Master's Thesis, Western Connecticut State University.
PUB TYPE Reports - Research/Technical (143) -- Dissertations/Theses - Master Theses (042)

EDRS PRICE MF01/PC03 Plus Postage.
DESCRIPTORS *Classroom Environment; Comparative Analysis; Grade 4; Grade 5; *Grouping (Instructional Purposes); Intermediate Grades; Reading Achievement; *Reading Instruction
IDENTIFIERS Comprehensive Tests of Basic Skills; *Mixed Age Groups

ABSTRACT

A study examined the effects of multi-age/grade instruction, compared to the traditional single-grade approach, on the reading achievement of fourth graders. Subjects, 22 fourth-graders in a single-grade class, were divided into instructional groups based on chronological age while the instructional grouping for 22 students in a combined fourth and fifth grade class at a neighboring school cut across age and grade levels. The Comprehensive Test of Basic Skills was used to measure the growth in "total reading" over a 1-year period. Results indicated no statistically significant difference between means of the two groups, although a positive mean score in favor of the multi-age instructional design was noted. (A 50-item bibliography, and the themes of study and sample lesson plans for both groups are attached.) (RS)

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ED309388

A study of the effectiveness of instruction in multi-age grading vs. traditional single -grade level organization on the reading achievement of 4th graders.

Submitted in partial fulfillment

of the

Requirements

for the

Master's Degree.

Fidelma Healy Eames
Western Connecticut State University
April 1989.

CS005732

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Abstract

This study was conducted to determine the effects of multi-age /grade instruction, compared to the traditional single-graded approach, on the reading achievement of fourth graders. Students retained their grade/age-level assignments and maintained their grade/age-specific curricula. The sample included two heterogeneously grouped 4th grade classes from neighboring schools. The only variable between the two classes was the instructional design. The CTBS standardized test, given annually in both schools, was used to measure the growth in "total reading" over a one year period.

Results show that although there is no significant difference between means of "total reading" at the $p \leq .05$ level, for these two classroom designs, a positive mean score in favor of the multi-age instructional design was noted nevertheless. There are important implications emerging from this study and the literature, encouraging the integration of multi-age classrooms in the organization of schools. The mixed-age classroom is a source that goes beyond conventional ways of teaching in meeting children's social, emotional and academic needs. It equally meets traditionally imposed academic standards without sacrificing the intent and structure of the multi-age grouping process. Further research is warranted and advised, using larger samples and other instruments of measurement, in order to arrive at conclusive findings in this area.

Chapter 1

Introduction

It has been said that the most important factor in children's learning to read is the quality of instruction (MacDonald and Wurster,1974). Let us look at the development of instructional practices over the years. The humble beginnings of our Education system as we know it today started out in the dedicated one-room school house that emerged in the 18th century, where a full-time teacher would use individual and tutorial methods to instruct a group of 10-30 pupils ranging in age from 6-14 years (Cremin,1961). As society demanded more widespread education, and the need grew to cater with larger numbers of children, schooling moved to age grading (Boston's Quincy grammar school,1848).The latter is known today as traditional education as it is by far the most prevalent. It has without doubt served us well, but not without its shortcomings. By changing from the family atmosphere of the multi-age one room schoolhouse to the rigidity of a graded organization whose needs were we serving ? Were they those of the child or a linear solution to solve the needs of the masses? Almost a century and a half later, these are still prominent questions. It appears that education has gone the full circle as we turn back the clock to regain that special learning atmosphere present only in classrooms where children of mixed ages work together (Neill,1975, p.25). Parents, educators, and administrators alike debate over what's best for our children. Freeman(1984) states that her students think of themselves as multilevel people who need help with some things and who are able to give help with others - a human being confident in his strengths and aware of his limitations. On the other hand, some parents are only happy when they know exactly what grade their child is in. This need for standardization and uniformity is the yardstick by which they judge their child's capabilities. This researcher puts forth the notion that children must be given the choice of a learning design/environment that will build on their interests and develop them as independent learners with the necessary skills and self-worth to go forth.

The debate surrounding the advantages and disadvantages of

the single-grade versus the multi-age/grade classroom is not new. However little research has been conducted on the cognitive effects of multi-age classrooms (Hollifield,1980; Goodlad &Anderson,1963; Mobley,1976). Review of the literature indicates inconclusive results regarding elementary reading achievement in single-grade vs. multi-grade organizational patterns. Most studies contain major weaknesses that confound valid interpretation of the results. This paper looks at this issue from the point of view of which classroom instructional design (traditional or multi-age) best supports reading achievement in 4th graders .

Statement of research problem

The purpose of this study was to determine whether 4th grade students in a multi-age class score higher on reading achievement, than 4th graders in a traditional single grade classroom, as measured by the Comprehensive test of basic skills (CTB/McGraw-Hill), Level F, Form U,1981, in "total reading". The study is designed to provide data on whether there is any significant difference in pupil reading achievement due to single-grade or multi-grade class organization.

In both the single-grade and multi-grade classes, reading instructional groups are formed so as to provide instruction at the child's current level of achievement. In the traditional class, pupils are divided into reading instructional groups with pupils of the same chronological age group (within a span of twelve months). In the heterogeneous multi-age classroom, grouping within the classroom cuts across age and grade levels.

Search of the literature

Traditional teaching

In the early 1800's educational, social, political, and economic conditions influenced the development of the graded structure in the elementary school. Traditional schools were introduced to the U.S. by H.Mann (Sec. of Mass. Board of Ed.) after visiting one such school in Prussia in 1843. The establishment of teacher training schools,the popularity of the monitorial system, the influence of German education,the call for state supported education, and the appearance of graded texts all served to solidify the graded structure for American schools (Goodlad & Anderson, 1963).

No sooner had the graded structure become firmly established in the public school system than critics began to attack its rigidity and lack of individualization. From the mid-1800's to the mid-1900's, numerous grouping and grading plans were developed to improve instruction and enhance student learning (Shane,1960).

The philosophy of grouping children into grades was based upon the assumption that greater learning takes place when children of similiar achievement are in the same classes. Rehwoldt (1957), suggested that although educational research has not substantiated this practice, it continues because of administrative expediency and the contention that teaching is easier when limited to a single grade.

Indeed the nature of traditional grade level organization is a single teacher for each grade (Encyl. of Ed. ,1971,4:203/4). There is a pre-designated curriculum with a one year age span, restricted to definite courses of study (Neill,1975, p.29). Grade levels are sequential with an emphasis on orderly progress in curricular content (Milburn,1981,p.513).

In the single graded classroom the child is expected to cope with a series of changes: a new figure of authority; new system of behavior; and initial lack of support from friends and familiar faces when entering a new grade. This indeed may affect a child's achievement if he/she is dislocated psychologically by all of these adjustments. (Buston,1977-78,p.144) ." This annual

transfer appears to be based more on customs than on rational grounds" (H. James from Periods of stress in Primary Schools).To add to this, teachers in traditional classrooms don't have sufficient time to individualize programs for specific children as pressure to meet curriculum demands and bring each child up to par within the school year creates a lock-step graded system. Equally, sequential lock-step curriculum makes it difficult to handle children with individual differences as it doesn't allow for flexibility (Milburn,1981,p.513).

There are many advocates of traditional grade level organization and indeed the single grade classroom is the most prevalent administrative arrangement (Craig & McLellan, 1987,p.5). Strict age-segregation is a phenomenon of the last century and since most of us grew up in such a school system it is easy to assume that such a school structure is both natural and universal, but in fact this is not the case (Pratt,1986, p.111). Administrators saw the graded system in parallel with successful manufacturing and thus the traditional system that we have relied on to educate our children for generations began as the will of urban educational bureaucracies (Pratt,1986, p.112). It was without doubt politically safe and administratively convenient -a fact that still remains true today.

It is little wonder then that this design nurtures class derived values. Traditional schools measure literacy and its students as 'high' or 'low' in terms of this arbitrary standard. Young (1971) argues that the graded system becomes an agent of social repression since it overlooks other personal and intellectual skills like creativity, adaptability, leadership, and practicality, necessary also to the all-round development of the individual. Children and parents still use grade names, still compare each other, and are not quick to accept intellectual growth in any form other than in reference to absolute standards. (Buston,1978, p.149).In a study by Yarborough & Johnson (1980), although reading instruction in the graded school was developmental in nature, pupils were still marked according to specific standards. At the end of each school year pupils were promoted or retained according to achievement in reading and other key subjects. This study showed how these children were viewed as members of a larger group, with whom they were

compared periodically as to their reading achievement and within which they would be regarded as 'failures' if they did not make what teachers regarded as appropriate progress.

Ricciotti & Soares (1983),in a 6 year longitudinal study comparing traditional education with that of an experimental design found differences seemed to exist in first year of study (grade 1) in favor of traditional model in the areas of vocabulary and comprehension, but in analyzing data over a 6 year period students in experimental schools had made net. gains in reading achievement. In the traditional school there was a downward trend of test scores in terms of actual achievement, as compared to predicted achievement in reading. Eventhough the traditional model had IQ superiority they did not outpace the other groups (non-graded and open space). The researcher notes how continuity and consistency benefited the innovative design in the long run.

Today both homogeneous and heterogeneous groupings are practised widely in traditional single grade classrooms in an attempt to meet student needs. Junell (1971) notes positive research findings across abilities and ages for the latter. However D. Esposito (1971) indicated that the same learning process went on in self-contained elementary classrooms irrespective of grouping pattern used. The results on grouping arrangement show that whole class teaching is very common and the predominant teaching method in single age classes (53% of the observed time during language instruction) with approximately 45% of time spent working alone (Veenman,1985,p.177).

Results favorable to traditional single-grade Organization.

Parents often show preference for the single grade traditional class. Veenman (1985) points out that parents in the Netherlands think that pupils in mixed age classes will not attain the same levels of academic achievement as pupils in single age classes. This was supported by an investigation of fourth grade pupils in West Germany; significant differences favoring the teaching of german , mathematics, and geography, in single age classes were reported (Fippinger,1967). Equally in a study conducted in England by Her Majesty's Inspectorate (1978), it was found that for 7 and 11 year olds teachers of single age classes showed a definite superiority ,as observed by the inspectors, in matching the difficulty of the work with the capabilities of the pupils . Foshay (1948) reported significantly different results in reading, favoring the traditional single grade class over the multi-grade,in grades three through six. However he later cautioned against generalizability of his findings due to the small sample. Finley and Thompson (1963) found one study (Marten's,1954) favoring single-grade classrooms. It compared matched pupils completing eight years of one-room schools versus those completing eight years of graded, town schools with one teacher per grade. Analysis of variance results favored town students: P< .01 in reading vocabulary, comprehension,and total reading. This summarizes some of the most relevant research favoring "traditional" teaching.

Multi-age Teaching

A Multi-age classroom is one made up of children whose chronological age and assessed intellectual growth reflect a differentiation of several years and thus considerable variety in the child's emotional, physical, and psychological functioning. The children remain together with the same teacher for a

specified period of time, generally 2-4 years (Buston,1977-78, p.143). The rationale for multi-age grading assumes cognitive benefits for children since chronological and mental age do not always correspond (Milburn,1981,p.513). It should be understood that multi-age grouping is not contingent upon any particular educational theory or practice ; the term refers only to the classroom organizational structure (Way,1981, p.69). It is frequently referred to also as family grouping, mixed-age, multi-grade and combination grading. They are all varying degrees of multi-age designs. Even the split-grade classroom, the least radical multi-age structure, can deal flexibly with faster and slower learners (Pratt,1986,p.114). The same concepts of multi-age teaching are also imbedded in the non-graded school but it can span wider levels ex. 6 years. Johnson (1986) reports teaching in a one-room school setting provides children with the opportunity to grow up in a microcosm of a local community, a "neighborhood" of various ages; abilities; interests and opinions. These inherent values are in any multi-age classroom to a greater or lesser degree depending on the intensity of the design.

Multi-age teaching is an approach where personalized learning focuses on the individual, not just on the instruction (Neill,1975,p.27). The curriculum becomes the sum of all the child's school experiences behind which there is a master plan structured by the teacher(s). Children gain both socially and academically when they are placed in classes with older and younger children. There is support found in the areas of learning theory and child development that encourage concepts of multi-age despite the fact that many research findings are seldom generalizable (Martin & Pavan,1976, p.310). Piagetian research is consistent with this; Piaget indicates that interaction between individuals at different levels of maturity will stimulate disequilibrium necessary for cognitive growth (Pratt,1986,p.113). An atmosphere of sharing and helping is conducive to learning. Behavior problems too become less of an issue in a multi-age class as children and adolescents choose friends who are at an equivalent level in terms of development rather than chronological age, so harmony rather than

aggression is more frequent (Hartup,1976).

Peer pressure, and imitation also come into play. The act of explaining to others is excellent for higher order cognitive processes - easily visible in the combination class, this represents one of the finest ways to solidify own learning (Cohen,1986, p.18/19). Marklund & Hanse (1983), in Sweden, found mixed age classes at junior and intermediate levels have emerged as a means of improving the attainability of curricular goals and ambitions, as the pupils actively participate in planning their own work and joint activities. To quote one teacher, who had been teaching in traditional classrooms for 8 years - the multi-age program gives each child a chance to share his/her experiences and "to become a hero to another person" (Neill,1975,p.27). One of the effects of this is that children receive maximum verbal stimulation and develop new vocabulary most rapidly when grouped with children slightly older than themselves. Tutoring studies support these conclusions also (Pratt,1986, p.113). Indeed there is evidence for increasing peer-tutoring rather than increasing instructional time (Levin,Glass,and Meister,1984) . Learning is visible at all levels - the Plowden Report states "we have been impressed by the liveliness and good quality of the work in Infant Schools where classes extend over 2/3 age groups".

Some of the marked features of multi-age classes are greater flexibility in classroom organization, more individualized instruction, cross-age tutoring where children are encouraged to learn as much from each other as they can from teacher instigated activities (Buston,1977-78, p.144), and the opportunity to group children according to ability level rather than grade level. The socialization alone promotes better emotional stability and security among young children, an important factor in early learning and attitude toward school (Martin & Pavan,1976, p.312). As one would expect this leads to academic benefits too - a study by Dennis Milburn (1981) showed that student reading achievement in the lower grade level in a combined class increased above grade level, and those in the higher grade achieved at or above grade level. He goes on

to speculate that the seeming advantage of multi-age grouping is in emulation. Lincoln's (1982) and Yerry's (1964) study favored upper grade students at primary grades but found no differences at intermediate levels in "total reading".

There is no concept of failure; if one is unsuccessful one merely tries another activity. Through responding to the interests of the children, the traditionally imposed academic standards are met without sacrificing the intent and structure of family grouping. It is this fact that has surprised the critics (Buston,1977-78, p.147). Way (1981) proves, that despite what skeptics think, achievement does not suffer when children of different ages are placed in a multi-age classroom. An added benefit is that learning is occurring in a happier environment. To quote Way (1981,p.74) "joy in the process of learning is certainly a worthy goal for education ".

Time is also on the side of the child in the multi-age class (Milburn,1981,p.514). An extremely favorable example of this is evidenced by the non-graded approach. Non-graded learning implies that children will proceed through the same elementary school curriculum, but that the rate will vary depending upon the child (Encycl.of Ed.Research,1982, p.547). The following are the results of 23 studies conducted on the effectiveness of reading instruction within nongraded settings as compared with that offered in traditional graded schools. Twelve studies cite advantages in achievement for pupils attending nongraded schools: Bockrath(1959), Bowman(1971), Buffie(1962), Carbone (1961), Corbin(1967), Halliwell(1963), Hickey(1962), Hillson and others (1964), Jones,Moore,and Van Devender(1967), Lawson (1974), Morris,Proger,and Morrell(1971), Vogel and Bowers(1968). Nine studies report no differences in achievement: Anastasiow (1968), Bowman(1971), Case(1970), Finley and Thompson(1963), Hopkins, Oldridge and Williamson (1965), Kierstead (1963), Novak (1973), Remacle (1970), Ross(1967). Three additional studies report inconclusive findings: Brody(1970), Ramayya (1972), Williams (1966). Most of these studies were conducted at the primary level (grades 1-3). In the study by Ricciotti & Soares (1983), there is continuous data for a six year period where the practitioners were seeking

alternatives to the more traditional model to :1)improve upon cognitive and affective outcomes for children by giving them the necessary time at their level , 2) to provide for individual differences by appropriate curriculum support. As a result of such an experiment it was concluded that a non-graded setting was not detrimental to reading achievement.The findings of this study are noteworthy. On this issue of time, Veenman (1985), in his study of mixed age classes in the Netherlands, found considerable variability between single and mixed age classes on the amount of time on task - mixed age spent 45%-89% of time on task , single age 61%-85%. Yet in traditional or multi-age classes none of the tests in reading of grades 3 and 4 showed significant differences (Veenman,1987).

Research findings on Multi-age

Between 1930-1983 most of the investigations of multi-grade classes indicated no significant difference between reading achievement gains in multi-grade and single grade classes (Pratt,1986 p.113; Gayle, 1983,p.iii). All multi-age classes contained a range of two to three years. Four studies evidenced results that were mixed, and the remaining studies showed no significant differences. All four of the primary grade studies (Harvey,1974; MacDonald,1974; Adair,1977; Lincoln,1981) showed no significant differences between single grade and multi-grade classes. Of the three studies limited to intermediate students, two (Dryer,1949; Adams,1953) showed no significant differences (Gayle,1983 p.iv). Of the seven multi-grade studies that included both primary and intermediate students, three (Knight,1938; Chace,1961; Way,1969) reported statistically nonsignificant results and four showed mixed results. In the Rehwoldt and Hamilton study (1957), reading achievement favored multi-grade classes at first, third, and fifth grades. Yerry's (1964) study showed no significant differences between single grade and multi-grade classes at grades two, three, and six; significant differences in grade one favoring multi-grade classes on total achievement; and at grade five favoring multi-grade in reading

and total achievement also. The Milburn (1981) results favored multi-grade classes in vocabulary but found no significant differences on other tests. Johnson, Johnson, Pierson & Lyons (1985) reported that multi-age learning groups had greater achievement motivation than did the single age groups. Students in the multi-age conditions did perceive themselves as engaging in more individualistic behavior, had a greater sense of personal efficacy and perceived themselves as being more motivated to learn the assigned material than did their counterparts in the single age class (p.845/6).From this review, it can be seen that major deficiencies exist in the research conducted on this topic. Needless to say, an educational decision in the area of reform of grade level organization, definitely merits further research.

The teaching of reading

The teaching of reading is marked by instructional grouping . In examining grouping, one is reminded of how intrinsically linked the teaching of reading is to the development of a student's psychological and emotional well-being. We need to be aware of these non-cognitive aspects of grouping and strive to create positive classroom environments for all children, regardless of ability level (Jongsma,1985 ,p.920). Pink & Leibert (1986) argue that grouping practices in schools typically result in the institutionalization of academic failure and in stigma and low self-esteem for pupils in the low groups, since students are usually grouped into homogeneous classes (tracks) designed for fast and slow learners. Ironically the purpose of grouping is primarily to enable the student to gain the most from time spent in class (Hanngi,1971). Hallinan (1982),identifies six generalizations about the effects of grouping that emerge from the research:

1.the most common basis for instructional grouping is student ability - studies show that this is the predominant means of organizing students for the teaching of reading.

2. In practice, the assignment of students to tracks or within-class ability groups is largely independent of individual students' ability

or academic achievement - often controlled more by organizational constraints like teacher time ,resources etc...
3.Instruction differs across tracks and ability groups. Low achievers rarely read for meaning due to inappropriate instruction. When low achievers do poorly on standardized tests, primarily because they cannot make inferences and draw conclusions, they receive even more drill and narrowly focused instruction that ignore the wider context in which these processes should be practised,and a vicious circle continues (Pink & Leibert,1986,p.55). By contrast, Milburn (1981) found that a multi-age setting helped low achievers in reading.
4.Behavioral processes differ across and within tracks and ability groups.
5.Student social status differs across and within tracks and ability groups. Oakes (1988) says "no wonder we find a 'rich get richer and poor get poorer' pattern of outcomes from tracking. It seems that tracking is both a response to significant differences among students, and an ongoing contribution to those differences.
6.Tracking and ability grouping are deterrents to learning for students assigned to low groups. Leinhardt & Palley (1982), say it is evident that low-ability, homogeneous grouping is not associated with significant gains in achievement. A more likely and more complex answer is that track-level differences get produced as teachers and students interact in school (Oakes,1988,p.43).

What therefore are the implications of these findings on practices in the single grade traditional class and the multi-age class, in the teaching of reading? Hallinan (1982) argues that students should be reassigned to different groups if their learning rate warrants it. The nature of the multi-age class make-up allows for this flexibility. It is not as common in the traditional classroom as the children tend to get locked into ability groups . On the whole, this practice depends on the perception and management of the teacher. Oakes (1988) reports that educators are seeking alternative ways to meet the individual needs of all students within more heterogeneous

settings. The quality of instruction must be constant across levels in order to prevent labelling of 'high', 'low' etc.. common to the graded system. Student characteristics should be considered in assigning students to peer work groups . This is something that works itself out more easily in the multi-age class as children frequently associate with peers of their own developmental level (Pratt, 1986,p.113). Teachers need to be aware of the unintended consequences of tracking and ability grouping. They need to view academic ability as not unchangeable but developmental-growing throughout childhood (Oakes,1988,p.44). Both teachers of multi-age and traditional classes that use such practices in the teaching of reading must consider the possible effects. This researcher suggests that the benefit of the multi-age instructional design is that it can be more flexible in its grouping practices. It is not as tightly locked in as is the graded approach and consequently children are less likely to suffer emotional/ psychological scars.

Co-operative learning, in the area of reading, is seen as a viable alternative to traditional instruction; it sets up students in teams and team members are responsible for one another's learning as well as their own (Slavin,1987,p.74). In a CIRC (Cooperative Integrated Reading and Composition) program students performed better on two reading skills (decoding and comprehension) with noticeable vocabulary increase (effect sizes of .175 and .121 standard deviations respectively) in a classroom for 3rd and 4th graders.These significant effects provide strong support for the partner reading and partner word-practices used in CIRC (not unknown to multi-age classes) (Stevens, Madden, & Slavin, 1987,p.451). The basal reader and reading groups are still retained as in traditional classrooms, but the difference here is the pairing of students to read to one another, make predictions, summarize stories and practise spelling (Slavin 1987,p.78). This in effect is one of the essential differences between multi-age and traditional instruction, as the former capitalizes on its heterogeneity to teach and benefit a wider group of children. As Slavin (1987) points out, cooperative learning methods make better use of the one resource every school has in abundance - kids themselves.

Since comprehension is the ultimate goal of reading, the close relationship between vocabulary and comprehension (Davis,1972; Johnson,Tomsbronowski,and Buss,1983; Spearritt,1972) suggests that building vocabulary is one of the major responsibilities teachers face. Many educators agree that experience is the cornerstone of vocabulary development (Horn,1942; McKee,1937; O'Rourke,1974; Petty, Herold, and Stroll,1968; Stephens,1956; Tinker,1952). What a broad experience base a teacher has at her fingertips in a multi-age class. Duffelmeyer (1980), compared an experiential technique (dramatization) with a traditional technique (a combination of context clues, word parts, and dictionary use). The students in the experience group scored higher on delayed retention vocabulary tests than the students in the traditional group at all three levels of reading ability. A similiar technique can be incorporated in comprehension. Nolte & Singer (1985) reported that teaching 4th and 5th graders to ask themselves questions about key points in a story significantly improved their performance on tests about story content-this method of active comprehension is a process of generating questions throughout reading. Current instructional practice focuses on the product of comprehension. Students read, teachers ask questions, and students answer them. Little emphasis is placed on direct instruction of a process of comprehension. With the cooperative learning strategies of a multi-age design students can work together in this process of active comprehension.

This researcher suggests that much of the literature findings are geared at avoiding the pitfalls and negative aspects of traditional instruction. Oakes (1988), argues that heterogeneous classrooms are a possible solution. She says there is considerable evidence that even the very best students make stronger intellectual gains while working with students of varying skill levels than when they work alone (p.46). This manifests itself perfectly in the multi-age class.

Teaching styles

There are two contrasting teaching styles being examined here:
the traditional teaching style is curriculum centered and teacher directed. Although this teacher is conscious of the child, the style incurs a lot of pressure because of the graded restraints. It is basically a chalk and talk environment in which students passively listen to the verbal presentation of teachers (Cusick,1973: Chadwick,1979).

Still, many "traditional" teachers are excellent in their teaching and their dedication to the child. Many readers can, in fact, vouch for this as more than likely the majority of their school years were spent in such classrooms. The teacher of the single graded traditional class gets locked into covering the curriculum as quickly as possible, in order to allow for review at the end of the year to prepare the children for testing. Moreover there is the added pressure of ever-widening curriculum demands as society's problems become more complex. Yet the "traditional" teacher must cater to individual needs where possible. Teaching within such a lock-step graded system can add up to a lot of student frustration and teacher burnout, as both parties in turn are being pushed, and are not allowed the necessary time to work at their own pace. Thus the writer feels compelled to add that the graded system destroys many fine teacher-pupil working relationships, by moving these pupils to another class and unfamiliar setting after one year. Teachers of the multi-age at least are rewarded by seeing the fruits of their labor. As the restraints of the traditional single-graded system have become more evident, some "traditional" teachers have become a little more flexible by team teaching with other teachers of a similiar grade in agreed curricular areas. Attempts at allowing the children to work in groups, and make more choices, has helped to alleviate the predictability of constant seat-work. Piaget's theories support the notion that children need a variety of stimuli, and varying degrees of time to internalize their learning. This is something that the "traditional" teacher is hard-pressed for in the single-graded

classroom.

The multi-age teaching style on the other hand is child-centered; the teacher is concerned with addressing the child's needs and interests in a positive way to achieve the curriculum goals. The multi-age approach requires a new attitude, a new teaching style, and much more work on the part of the teacher - the challenge posed by combined classes is that of planning and teaching two separate curriculums.(Neill,1975,p.27 ; Freeman,1984,p.48). Since teachers are the key to multi-age grouping (Neill,1975,p.29) the teacher learns how to focus on the child instead of the curriculum; how to individualize instruction and to establish and maintain a strong structure. Veenman (1985) found that teachers expressed difficulty in managing a mixed age class, mainly because they largely taught the classes as two separate grades. Pupils are rarely actively engaged in learning directly from one another, or instructed in small groups with the same aptitude dispersion. Each pupil essentially works and achieves alone within a group setting (cf. Galton, Simon, & Croll,1980; Veenman,1987,p.87). The researcher alerts the reader to this possible pitfall, as in this case the children are not experiencing the benefits of a true multi-age design, but rather that of two traditional single-grade classes together. This is, in reality, twice as difficult because the teachers don't have the know-how . Teachers have a need to be informed and receive appropriate inservice too.

A multi-age teacher must understand the pattern of introduction, gradual assimilation, and independent performance, that emerges from the classroom entrance routine. This pedagogical basis of family grouping borrows from the work of Piaget, Bettelheim, and Bruner. Its style is manifest in a flexible approach to concept development in the young mind (Buston,1977-78,p.145). The child's personality defines a learning style , which in turn, creates a personal standard of achievement (p.148) .The multi-age design avoids the trauma of adjusting each year to a new adult with a different teaching style and unfamiliar expectations (Milburn, 1981,p.513) common to traditional single grade organization. The teacher /student relationship is valuable in any learning situation - why be quick

to break down one that is working? Among some of the most important qualities in a teaching style affecting reading achievement according to Ricciotti & Soares (1983) are the following :
- flexibility in grouping practices
- flexibility among teaching strategies and methods of teachers;
- record keeping practices;
-teacher commitment.There must also be congenial sharing among teachers of responsibilities and resources involved.

Naturally all teachers possess these qualities to varying degrees, but it would appear that teachers supporting and practising the underlying philosophy and concepts of multi-age teaching should be more adaptable.

The basic question of this study is whether significant pupil cognitive achievement differences exist between two systems of vertical school organization, namely, the traditional and multi-age plans, as measured by the CTB/McGraw-Hill's Level F, Form U, 1981, in "total reading".

Hypothesis

The null hypothesis is situated below:

There is no significant difference at the $P < .05$ level between means of "total reading", of 4th grade pupils in traditional single-grade and multi-age/grade classrooms.

$$H_0 : U_1 = U_2$$

Chapter 2

Methodology

Permission has been granted by the principals and teachers of both schools involved, to carry out this study. Both parties were interviewed and they expressed their interest and offered their support for same. The research was carried out in an ethical manner as stipulated in Research In Education (McMillan & Schumacher, 1989). The confidentiality of the subjects was of utmost importance to the researcher.

The following is a description of this researcher's study and includes a definition of terms used, a description of subjects, the instrument of measurement, the procedure, and analysis of data.

Definition of terms

The following terms will be used throughout this study.

Traditional/ Single - grade classroom:

A classroom which has one teacher for all subject matter areas except for special teachers; i.e. art, music, library, and physical education. Pupils of like chronological age are placed in this class.

Multi-age/grade classroom:

This classroom organization pattern retains grade level designations and groups pupils of more than one age/grade level together in a common area. This group may be taught by one or more teachers.In this study the multi-age class benefit from the teaching of two teachers in a team situation.

Graded school:

A school which allows for the student progress by grade,

subject to expectations held for his certain grade and chronological age. Self-contained classrooms exist.

Non-graded school:

A school with emphasis on the individual. Vertically the graded structure is replaced with the non-graded plan. Horizontally the grouping patterns are flexible. Team teaching replaces self-contained classrooms. A school which allows pupils to progress at their own rate i.e. developmental.

Family grouping:

A classroom of children whose chronological age and assessed intellectual growth reflect a differentiation of several years and thus considerable variety in the child's emotional, physical, and psychological functioning. The children remain together with the same teacher for a specified period of time, generally two-four years (Ridgway & Lawton, 1969).

Vertical organization:

The organization which classifies students and moves them upward from a point of school admission to a point of departure from school.

Horizontal organization:

This dimension of school organization involves teacher and student placement patterns; it concerns the assignment of students to teachers and instructional groups. Examples of this dimension include the self-contained classroom and team-teaching groupings (Wilt,1971).

Heterogeneous grouping:

Pupils may be assigned to a class on the basis of homogeneous pupil characteristics in such categories as aptitude, maturity, and/or others.

Homogeneous grouping:

Pupils may be assigned to a class on the basis of one single similiar characteristic e.g. ability .

Total reading:

The Comprehensive Test of Basic Skills "total reading" score is a composite of vocabulary, sentence and passage comprehension.

Reading instructional group:

Children within the classroom of approximately the same reading level who are placed together for instruction by the teacher to form a reading instructional group.

Flexibility:

Organizational procedures that allow for student movement to, from, and within designated levels of instruction.

Team teaching:

An aspect of horizontal organization which has at least two teachers working with students. The team confer regularly with each other, and jointly plan the students' activities.

Subjects

Two sets of youngsters were the subjects of this research study. They were between the ages of 9-10 years approx. Traditionally speaking, they were in 4th grade. They attended the same public school district in the Dutchess County area . The children came from a similiar socio-economic middle class background with parents engaged in the professions, self-employment, and in many cases where both parents were actively working outside the home. Both schools followed a similiar curriculum, and duration of day ,as required by the district. The principals both supported similiar child -centered learning/teaching philosophies with the interests of the children being first priority. They actively encouraged their teachers to be flexible in their teaching so as to incorporate the needs of every child. The teachers involved in the study were experienced at their grade level; the 4th grade traditional teacher has been teaching this level for 18 years. The teachers of the multi-age have been teaching for 17 years and working together as a team for 11 years.

The first set of youngsters were those who attended the 4th grade, traditional single grade class. Of the 22 children studied in this class 9 were boys and 13 were girls. They had the same teacher (female) each day for the entire duration of their 4th grade i.e. one school year. This was a heterogeneous group, randomly placed with high, middle, and low achievers. Reading was taught using the traditional teacher-directed curriculum, as the teacher believed it was a more clear,definite,and structured way for the children to learn. She put forth the idea that traditional single grade level organization lent itself readily to " freedom within a structure " as there was room for whole class teaching,independent seat work and the pairing of a high/ low achiever ,if necessary. Children frequently grouped themselves voluntarily to work together on an activity. This teacher began her three reading groups (high, middle, low,) on Dec. 1st of the school year. She used teacher recommendations, her own observations, and resource room input / CTBS scores , where

necessary ,to group the children. Flexibility was common within the reading instructional groups. The reading materials used were the Barnell Loft Specific Skills series, in conjunction with the SRA kits, to teach vocabulary and comprehension. A literature base was also co-ordinated to enhance the language arts /social studies areas. The use of one computer was also available in the classroom.

The second group of children attended a 4/5 multi-age . Of the 22 youngsters studied, 9 were boys and 13 were girls. The organizational design was two adjoining classrooms with a large opening through which children moved back and forth according to the learning/teaching situation. For the sake of structure ,the 4th graders had their desks and belongings in one room and the fifth graders in the other, but this was the extent of the segregation ! Both 4th and 5th graders interfaced with each other (50 children in total), and with two teachers (female) during the school day. This group of children knew that they would have the same teachers for two years. According to the teachers ,this multi-age organizational/learning design was "the best of both worlds",as the children had the unique opportunity of experiencing a balance of multi-age and traditional grade level organization. As with the first group of children this was a randomly placed heterogeneous group with abilities falling along the normal bell curve range. The teaching of reading also took place in groups - seven in all, between the two teachers. These groups began the second week of the school year, (Sept.), and from the beginning these groups had both 4th and 5th graders in each. Cross-grading was thus practised immediately so the children got to know each other easily , and flexibility became second nature to them. These 4th graders benefited from positive role modelling by mixing with 5th graders. They enjoyed an immediate source of knowledge in their peers when the teachers were involved with other children. Indeed peer teaching was common practice when two children teamed to work together ex. paired writing activities. This in turn promoted self-esteem, in the multi-age environment. The

reading materials used were completely literature based spanning very wide reading levels. Social studies, science, and language arts were integrated with the reading program through the literature. Computer assisted instruction was also a very useful tool in teaching vocabulary and comprehension, as this multi-age class had a five computer center (3 types) within their classroom space.

The teachers here saw the multi-age as a two year process that allowed for time and maturity in the students' favor. Consistency was an inherent value to this design where the teachers planned and problem-solved together, conferenced together if necessary with parents, and most importantly worked together as a team with continuity, in the classroom.

Instrument of the Investigation

The standardized reading instrument used in this study is the composite score of "total reading" that comprises the subtests of vocabulary, sentence, and paragraph comprehension of the Comprehensive Test of Basic Skills, Level F, Form U (CBT/ McGraw Hill, 1981). In this test a high degree of reliability exists for reading subtest scores as well as for the "total reading" score with Kuder-Richardson Formula 20 reliability coefficients being in the 0.85 to 0.95 range. Conscientious construction procedures and certain internal measures (e.g. percentage passing items at each grade) support its content validity (Buros,1972). Correlation coefficients between the scores of the CTBS tests and those of the Short Form Test of Mental Maturity are unusually high, falling between 0.60 and 0.80.

Procedure

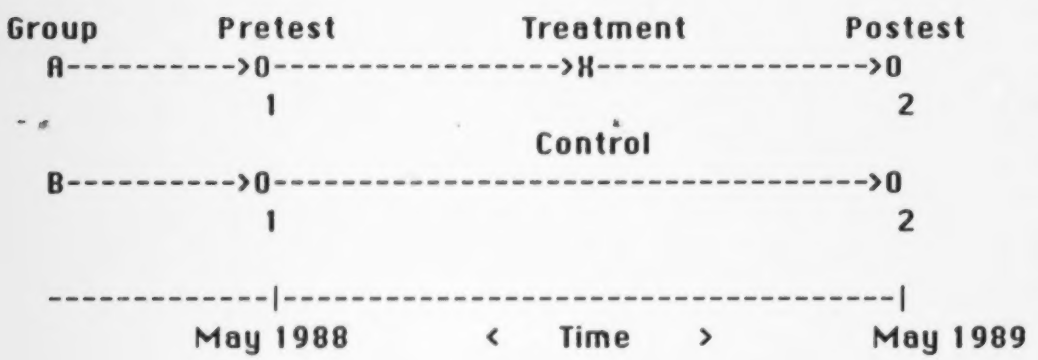
The two groups chosen to carry out this study are typical examples of their class titles i.e. a sample of twenty-two 4th grade traditional pupils, which is the control group and twenty-two fourth graders from the 4/5 multi-age/grade, which is the experimental group. As mentioned in the description of the subjects both were randomly placed heterogeneous classes. The selection variables were constant. Indeed this researcher assures the reader that internal validity has been accounted for as far as is possible.

Both groups undertook the CTBS test (Level E, Form U) in "total reading" in May 1988. This was the pretest and first observation. The duration of the experiment was exactly one year with the treatment being administered for nine months from Sept.1988 - May 1989. The post-test was administered in May 1989 (Level F, Form U of the CTBS test). This was the final observation. During this period the subjects attended school as usual; they were not aware of being studied and they followed similiar curricula and themes of study appropriate to their age, experience and grade level (see Appendix 1). All tests were administered by the classroom teachers according to the guidelines set forth in the testing manual and they were machined scored by the same company .

The researcher then collected the CTBS scores for May 1988 and May 1989 respectively. After collection of data was complete the data was analyzed using inferential statistics on Western Connecticut State University's vax system (minitab). The precise statistics and research design follow.

For the purpose of clarification the research design is graphed as follows :

$$H_0 : U_1 = U_2 \quad \text{at} \quad P < 0.05$$



The independent variable being the classroom instructional design. The dependent variable being the "total reading" score. A precise account of the classroom procedures, and subject matter taught May1988 - May 1989 appears in Appendix 1. A sample lesson plan from both the traditional and multi-age instructional designs appears in Appendix 2.

The researcher's aim was to have two equivalent groups in age, ability, educational experience, teacher experience, socio-economic background, testing environment, and scoring system. These measures have been established in this quasi-experimental research design. This accounts for the internal validity of this research design: such factors as diffusion of treatment have been eliminated because of the use of two different schools; teacher differences have been accounted for through personal interviews with the teachers and observations of both classrooms in action. It is to be expected that some of the language arts and literature themes differ throughout the school year, according to teacher and pupil preference. This is

addressed in Appendix 1 which shows the broad spectrum of themes covered by both the traditional and multi-age classes. Although the themes may differ in some cases, the skills being tested by this instrument are taught in the context of whatever the theme is. This leads the researcher to conclude that the independent variable in this research design is the classroom instructional design and the dependent variable is the "total reading" scores.

Analysis of data

Means were analyzed for both groups, from their scores on "total reading" on both the pre-test (CTBS, Level E, Form U) and post-test (CTBS, Level F, Form U). They were compared using a t-Test

$$\text{where} \quad t = \frac{X_1 - X_2}{S_{X_1 - X_2}}$$

where

t is the t-test statistic, used to compare the two means.

X_1 is the mean of the control group (traditional single-grade)

X_2 is the mean of the experimental group (multi-age/grade)

$S_{X_1 - X_2}$ is the standard error of the difference in means.

The level of significance used in this study is $p < .05$. The researcher's rationale for using this level of significance was based on the certainty or confidence with which the researcher was safe in rejecting the null. Due to error in sampling, one can only give the probability of being correct, and one can be fairly sure that a certain number of times out of a hundred the means we could draw would not be correct. Thus a $p < .05$ level is chosen and the certainty that the null is rejected is based on the statement that there is a "statistically significant" difference.

This concludes the rationale and procedures used in this quasi-experimental design (McMillan & Schumacher,1989).

Chapter 3

Results

The following is the statistical analysis of this study:

Control group (traditional 4th grade);

N	MEAN	STDEV	SE MEAN
22	706.0	40.7	8.67

Experimental group (multi-age 4/5);

N	MEAN	STDEV	SE MEAN
22	719.0	48.7	10.4

TTEST : T = 0.96, P = 0.34, DF = 40 (W.C.S.U. minitab).

The results of this experimental analysis show that there is no significant difference at the $p \leq .05$ level between means of " total reading" of 4th grade pupils, in traditional single-grade and multi-age classrooms. However, in considering the mean score, ignoring statistical significance, the researcher points out that there is a positive difference in the mean score, in favor of the multi-age instructional design. This reinforces many earlier findings that the multi-age classroom is as good a teaching design as traditional single grade level organization (Gayle,1983; Lincoln, 1982; Ricciotti & Soares, 1983; Way,1981). Both the minimum and maximum scale scores were proportionally higher for the experimental group over the control group. The range of scores was considerably larger for the multi-age, and the maximum scores achieved by two

children in the multi-age class were at least 6% higher than the highest score achieved by a single pupil in the traditional class. The experimental group scores reflect a greater range of abilities, thus reinforcing the multi-age concept of heterogeneity and that children find their own level of attainment according to the built in challenge of the instructional design (Buston,1977-78; Martin & Pavan,1976). Pratt (1986), also noted that for this reason such classroom designs deal more flexibly with faster and slower learners.

On the other hand, the thrust of the traditional group scores emphasize the middle range. This is suggestive of the fact that traditional teaching is geared to suit the average child. Again this makes sense, due to the rigid restraints of the lock-step graded system, as previously quoted in the research (Milburn,1981; Neill,1975). The standard deviation of the scores show the multi-age group to be a more heterogeneous group (bell curve) than the control group also. This is possibly as a result of the positive modelling of having mixed ages working and learning together (Cohen,1986; Milburn,1981).

The limitations of this study must be accounted for in this analysis too. These results are not generalizable, primarily due to the size of the sample. Both classes had only twenty-two pupils in each, that completed the pre-test and post-test. Further research is warranted with a much larger sample e.g. at least five classes of this size. The reader can see from the means and the "t" score results, that they are positive in favor of the multi-age class, but in order for the results to be significant a much larger sampling is necessary.

The author considers the use of the CTB/Mc Graw Hill standardized tests as the instrument of measurement, to be a major limitation of this study. The researcher's reasons are twofold for making this judgement. The use of the scale score, for statistical purposes was derived from the IRT (item response theory) scaling. On occasion differences greater than a full standard deviation have been noted between traditional number correct scores, and item pattern scores based on the IRT model (Robert Linn in Buros,1973). These seeming unreasonable properties of the scale score have important implications for interpretation of the results. It is for this reason that many teachers and educators have lost faith in the CTBS tests, yet

they are widely used by administrators and school districts throughout the U.S..

Moreover, the CTBS tests are not designed to measure the flexibility of a whole language multi-dimensional approach, such as is found in the description of this multi-age class. It is more geared to suit the traditional skills approach, as its format, tests skills in an isolated context. This style of testing would appear to suit the traditional single grade class more, as they used the Barnell Loft Specific Skills series to teach vocabulary and comprehension, whereas the multi-age experimental group were completely literature based. In consideration of this fact it is interesting to note that the mean score for "total reading" still favored the multi-age instructional design (719. 0) over the traditional design (706. 0). The researcher poses the question of how much more favorable the results would be if the instrument was designed to measure a whole language multi-media teaching design.

Since traditional single-grade organization has become so accepted and widespread in this country (Craig &McLellan,1987), one of the difficulties introducing multi-age and family grouped classes is lack of support and understanding within the community. A successful implementation of a multi-age instructional design requires school staff, parent and administrative consent (Marklund & Hanse, 1984). A hard-working, co-operative, enthusiastic staff is necessary especially in the first few years to boost confidence and set the pace for the new program (Neill,1975). It requires excellent public relations as most implementations have met with a lot of negative reactions. Many have equally overcome this, by working closely with the community. Some schools have won over the confidence of the parent body by only placing children in multi-age classes that express no resentment at this placement decision. It is futile to force a parent/child into a multi-age class if they have a totally closed mind to its benefits. Once the incubation period is over the multi-age process is a more natural way to operate (Cohen,1986) from parent, teacher, and pupil point of view.

Chapter 4

Conclusions

It is safe to conclude that multi-age classroom designs are equally as good as traditional single-grade level organizational designs (Gayle,1983;Way,1981). In this study the performance of students in the multi-age/grade class was higher for reading achievement (Gayle, 1983). This researcher puts forth a strong argument to administrators to put an end to only using multi-age and combination classes as an expedient measure to accommodate declining or increasing enrollment (Freeman, 1984). Instead such experimental teaching designs should be incorporated into the regular grade organization choices offered by a school (district). Remembering that learning takes place in many forms, styles, and settings, it is our duty as educators to provide for childrens' needs through as many instructional designs as possible. This is an implication of this study.

A recommendation for future research in this area is the measurement of the growth of self-concept using these two same instructional designs. All research to date, indicating the benefits of multi-age classrooms, show a higher self-esteem, better emotional stability, and student attitude among young children, functioning in a multi-age classroom design (Martin & Pavan, 1976; Milburn,1981; Plowden Report; Pratt,1986; Way,1981). Johnson (1986), argued that the multi-age setting prepared the child more adequately for the outside world, where real differences exist. It extends features of an ideal family into the school, by supporting and accommodating individual members and often compensates for lack of the features in the home (Buston, 1977-78). Freeman (1984), observed too how children viewed themselves as multi-dimensional in a multi-age class and coped accordingly. Therefore the all-round development of the total child is a realistic goal in a mixed age environment. This is wholesome proof in favor of the implementation of multi-age classrooms, to cater to the ever complex social and affective needs of our society.

A further recommendation would be to carry out a longitudinal study using these instructional settings. Ricciotti &

Soares (1983), proved the longer the period of time children spent in experimental and innovative classroom settings, the more beneficial it was to the pupils, and the more significant the results were. The real growth in reading achievement took place in their pupils after the first year of the implementation of their plan. Likewise the replication of this study at the end of 5th and 6th grades respectively, using the same sample, would yield very useful information and noteworthy results. Such follow-up studies are also urged by Gayle (1983).

The preceding research, and personal experience as a child and teacher in a multi-age setting , lead the researcher to conclude that one of the most valuable elements the mixed age classroom allows for is time (Milburn, 1981). Since pupils generally spend at least two years in these environs, with the same teacher(s), the nature of the classroom design puts time in favor of both pupil and teacher. This is a wonderful feeling for all involved, as it alleviates much of the hurried pressure of traditional single gradedness. Way's (1981) statement, " joy in the process of learning ....." comes alive. From a developmental standpoint the child has more time to grow; to learn about self ; to be comfortable and simulate his environment. Equally the teacher has the confidence to know that she has the time to observe the child; manipulate his environment to cause disequilibrium for learning (Piaget), and to individualize when necessary. If a concept is too difficult to accomplish this year - with time, repetition, and a working relationship the child will succeed next year. There is a definite need for this consistency and continuity in a child's education (Neill, 1975) - such knowledge and head-start on where the child is at, from one year to the next, is something that can never be present in the same way in traditional single grade level organization. As an aside to this, we often overlook how well special education children perform when mixed with peers of different ages within the same level. This positive modelling found in a multi-age class, and self-extension to teach someone else is excellent for higher order cognitive processes (Cohen, 1986). Little wonder then that the multi-age classroom scores so high in the social and emotional development of the individual, as well as Pratt (1986) indicates, interacting at different levels of maturity

to promote cognitive growth.

This study examined the growth of "total reading" of 4th graders, which incorporated a test of vocabulary and comprehension. In this particular 4/5 multi-age class the 4th graders were the lower group. They received maximum verbal stimulation and developed new vocabulary rapidly owing to the peer interaction and advantageous modelling of the 5th graders. It is with regret that this researcher did not test and analyse the results for the component elements of "total reading" separately. Research supports that the vocabulary growth of the lower group in a multi-age class will surpass that of the similar group in traditional single-grade organization due to the seeming advantage of emulation (Milburn, 1981) and peer tutoring (Levin, Glass, and Meister, 1984; Pratt 1986). A study in the area of vocabulary alone would therefore be recommended. Research studies need to be also completed on the effect of multi-age/grade classes on level - the upper or lower grade in the multi-age class (Gayle,1983).

In the teaching of reading a strong implication emerging from the literature is the use of heterogeneous groups (Hallinan, 1982; Oakes, 1988). Too often grouping practices in reading emphasize "high, middle and low" standards, rooting academic failure, stigma, and low self-esteem from very early on (Pink & Leibert, 1986). The multi-age classroom thankfully capitalizes on its heterogeneity; groups are flexible - students cross age and grade levels as in the case of this 4/5 multi-age group. Student placement has a broader base to work with. On the whole, there is no ceiling to children's learning. The reader will probably agree that personal experience of the assigning of labels e.g.(good, bad, the best) to children is detrimental. It is encouraging to see, in general, a trend towards heterogeneous groups (Junell,1971; Oakes,1988) as with this particular fourth grade traditional class (note however the standard deviation results demonstrated still more heterogeneity in the multi-age scores). Multi-age/grade research studies in the future are encouraged to consider the criteria for student placement in multi-age classes. Precise definition of criteria is advised (Gayle,1983).

Chapter 5

Summary

Having accepted the null hypothesis that there is no "significant difference" between means of "total reading" for traditional and multi-age teaching designs, while equally noting that the increasing difference in the means is in favor of the multi-age instructional design, one must acknowledge the inherent values of the process of multi-age learning/teaching as being the major reason to elect this classroom environment over the "traditional" one. Let us therefore summarize briefly the inherent values of the flexible multi-age classroom, which the study has examined.

Schools should be happy places -the family atmosphere of the multi-age classroom is evidence of a special learning where children of mixed ages work together in this environment (Neill, 1975). A positive setting for all children regardless of ability level.

Shane (1960), attacked the rigidity and lack of individualization of "traditional" education, whereas a very obvious factor of multi-age instruction is its flexibility and time element (Milburn,1981).

Multi-age instruction is on the side of the learner and not that of administrative expediency. Schools and administrations that want to incorporate the multi-age design into their organizational choices are praiseworthy, and thus supportive of child-centered practice. Martin & Pavan (1976) note areas of learning theory that encourage multi-age concepts.

This experimental approach handles children with individual differences, from the point of view of curriculum content, as it doesn't get smothered by the sequential lock-step curriculum of traditional single-grade organization (Milburn,1981; Pratt,1986).

A nurturer of creativity, adaptability, leadership, and practicality, the family grouping of multi-age instruction promotes both personal and intellectual skills. In the area of vocabulary alone, Duffelmeyer (1980), found that such a broad

experience base improved delayed retention in pupils over a more traditional approach.

Multi-age teaching, by its nature, is a proponent of heterogeneous grouping (Oakes,1988). Due to its mixed-age format it avoids labelling and class derived values to a greater degree. Young (1971), in contrast, accused traditional organization as being an agent of social repression.

Family grouping assumes cognitive benefits for children since chronological and mental age do not always correspond (Milburn,1981). It provides the child with a "neighborhood" of various ages, abilities, interests, and opinions (Johnson,1986). The multi-age design helps avoid behavior problems too (Hartup,1976), owing to its flexibility and the various developmental levels of its pupils.

Imitation, the act of explaining, and peer teaching make the mixed-age environment one of the finest ways to solidify own learning (Cohen,1986). Children learn as much from each other as they do from teacher instigated activities (Buston, 1977-'78)

Regarding this particular study, the multi-age was found to adequately support the teaching of reading to 4th graders (Gayle,1983; Lincoln,1982). The instrument of measurement was highly reliable and strong in content validity. Nevertheless, the researcher encourages the replication of this study using a different instrument, for reasons already discussed.

In summary, Wilt (1971) speaks profoundly when he says " no single organizational change can hope to solve the needs of learners in a mass heterogeneous society". Therefore, realistically speaking, the multi-age instructional design is an important alternative to offer in the organizational choices of a school. The author wishes to draw the conclusion from this study that the multi-age instructional design appears to uphold the principle that diversity enriches and uniformity impoverishes.

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Appendix

Appendix I : Themes of study

(a) The traditional 4th grade (control group).

September:
- Vikings and explorations of the North American Continent by Europeans.
- Native Americans and their relationships with colonists (Jamestown etc..).
- Native trees and why leaves turn colors.

October:
- Columbus.
- Henry Hudson and the settlement of the Hudson valley by the Dutch (also the English takeover).
- Dutch Colonists and customs.
- Washington Irving as author of Rip Van Winkle and The Legend of Sleepy Hollow.
- Bones, Skeletons, and Spiders for Halloween

November:
-Settlement of New England (Pilgrims etc..)
- Corn - its importance in history and today.
- Cornhusk dolls - toys of colonial children.

December:
- Reports on Christmas customs brought to America by colonists.
- Colonial crafts.

January:
- Matter, Molecules, and Weather.
- American Revolution including Washington's network across Long Island Sound.

February:
- Famous American Research Reports.

March:
- Continuation of Jan. and Feb. themes.

April:
- Environmental studies - a marshland and its importance.
- Lifecycle of frog.
- The Civil War.

May:
- "Being a pet parent" - animals in our lives.
- Sun and its effect on skin.
- Lifecycle of butterfly
- Rocks and minerals - Earth's changing surface.

This is a summary of the themes of study of the control group during the timeline Sept. 1988 - May 1989.

Appendix 2 : Sample lesson plan

This is a sample lesson plan on a newspaper article called " The Great Swamp Debate " (copy attached), used by the traditional 4th grade class.

Aim: Discuss the differences between two newspaper articles dealing with the same subject.

- define biased and controversy
- identify the main problems that need to be solved
  (a) build the airport in N.Y. or N.J.
  (b) build the airport in the Great Swamp
  (c) how big should the airport be
  (d) how far from NYC should it be

-List advantages and disadvantages of each site
-Identify attitudes toward swamps-present day and historically.
-Are there alternatives?
-Make a prediction as to what really happened.

Appendix

Appendix 1: Themes of study

(b) The multi-age 4/5 class chose from a very broad literature base during the period Sept. 1988 - May 1989. The following is a list of literature incorporated themes studied by the seven reading groups in this particular 4/5 multi-age/grade.

1988 :

- George, Jean. My side of the mountain.
Teacher's guide: Gr 4 Social Studies.

- Taylor,Sydney. All-of-a-kind-family. Teacher's guide.

- Speare, Elizabeth. Witch of a blackbird pond. Teacher's guide Gr 4 . Social Studies.

1989 :

- Drolet, Daniel. Children of Canada: Known and unknown. No guide: Gr 5 Social Studies Canada.

-Fritz, Jean. Can't you make them behave, King George? No guide. Gr 4 Soc Studies/ditto.

- Fritz, Jean. Shh! We're writing the constitution. No guide. Gr 4 Soc Studies/ditto.

- Fritz, Jean. Will you sign here, John Hancock? No guide. Gr 4 Social Studies/ditto.

- White, Florence. Junipero Serra. No guide. Gr 4 Social Studies.

- Butterworth, Oliver. Enormous Egg. Teacher's guide.

- Downie, Mary Alice. Proper Acadian. No guide. Gr 5 Soc. St. Canada.

- Fitzhugh, Louise. Harriet the Spy. No guide.

- Howe, Deborah. Bunnicula. No guide.

- Selden, George. Cricket in Times Square. Teacher's guide.

- Shyer, Marlene. Welcome home Jellybean. Teacher's guide.

- Smucker,Barbara. Underground to Canada. No guide. Gr 4 ss/ slavery; Gr 5 Canada.

- Aiken, Joan. Wolves of Willoughby Chase. No guide.

- Conly, Jane. Racso and the rats of NIMH. No guide.

- Konigsburg, E.L.. From the Mixed-Up Files of Mrs Basil E. Frankweiler. Teacher's guide.

- O'Brien, Robert. Mrs Frisby and the rats of NIMH. Teacher's guide.

- O'Dell, Scott. Island of the Blue Dolphins. Teacher's guide.

- Paterson, Katherine. Bridge to Terabithia. Teacher's guide.

- Burnett, Frances. Secret garden. No guide.

- Burnett, Frances. Little Princess. No guide.

- George, Jean. Julie of the Wolves. Teacher's guide. Gr 5 Soc. St.

- Graham, Kenneth. Wind in the Willows. No guide.

- Lunn, Janet. Root Cellar. No guide. Gr4 Civil War/ Gr5 Canada, Fic.

- Morey, Walt. Gentle Ben. No guide . Alaska.

- Raskin, Ellen. Westing Game. Teacher's guide.

-Taylor, Theodore. Cay. Teacher's guide.

- Byars, Betsy. Pinballs. Teacher's guide.

- Cleary, Beverly. Dear Mr. Henshaw. Teacher's guide.
" " Socks. " "

- Estes, Eleanor. Hundred Dresses. Teacher's guide.

-Coerr, E. Sadako and the thousand paper cranes. Teacher's guide.

- Erickson, R. Toad for Tuesday. No guide.
" " Warton and Morton. " .

- MacLachlan, Patricia. Sarah, Plain and Tall. Gr4 Soc St. Pioneers.

- Rockwell, N. How to eat Fried Worms. Teacher's guide.

- Selden, G. Chester Cricket's Pigeon Ride. No guide.

- Smith, Doris. Taste of Blackberries. Teacher's guide.

- Wagner, Jane. J. T. . Teacher's guide.

- Mowat, Farley. Owls in the Family. Gr 5 Soc St. Canada
(read aloud book).

The teachers of the 4/5 multi-age had their own criteria as to what piece of literature a reading group studied. This is a sampling of the choice of literature made available to the pupils.

Appendix 2 - Sample lesson plan (experimental group).

Book Title _____
Author _____

Writing activities - choose at least 4; you may do more.

____ 1. Describe what you liked/ disliked about some of the characters.
____ 2. Create another ending for the story.
____ 3. Make up a lost or found advertisement for a person or object mentioned in the story. Tell as much as you can about the person or object.
____ 4. Write a brief biography of the author.
____ 5. Compose a poem about the story.
____ 6. Send a letter to a friend to spread the good word about your book.
____ 7. Write letters as if one character were corresponding with one another.
____ 8. Give an account of what you would have done if you had been one of the characters in the same situation.
____ 9. Make up a conversation between two characters in story.
___10. Prepare newspaper articles about the characters' activities. Include headlines and so on.

Oral presentations - choose at least 2. You may work with a partner on these activities. These will be presented to the class.

____1. Dramatize a certain episode.
____2. Draw a mural of the story or parts of it.
____3. Create a puppet show with stick-figure puppets.
____4. Draw a map to show routes.

Vocabulary grades _____
_____
Summary grades _____
_____